State of California
Regional Water Quality Control Board
North Coast Region

Bonnie Rolandelli
Susan Warner
November 20, 2000

EXECUTIVE OFFICER'S SUMMARY REPORT
9:00 a.m., November 29, 2000
Eureka City Council Chambers
531 K Street
Eureka, California

ITEM: 9

SUBJECT: Consideration of a Resolution requesting Cleanup and Abatement Account Funds to Investigate and Abate the Groundwater Contamination on and about West College Avenue at Clover Drive, Santa Rosa, Sonoma County, California

DISCUSSION: INTRODUCTION

The purpose of today's item is for the Regional Water Quality Control Board ("Regional Water Board") to consider a request for additional funds from the State Water Resources Control Board ("State Water Board") Cleanup and Abatement Account ("C&AA"). The Regional Water Board is the lead agency[1] for oversight of the groundwater contamination in the vicinity of the intersection of West College Avenue and Clover Drive in Santa Rosa (Figure 1). The groundwater contamination involves discharges of tetrachloroethylene (also known as perchloroethylene or PCE), and has affected over twenty drinking water wells in the area. Approximately 125 domestic wells are located in this Sonoma County island area of Santa Rosa where no water main exists to serve the residents safe drinking water.

The PCE groundwater pollution plume extends southerly and westerly, with some drinking water wells having contamination as high as 576 ug/l or parts per billion (ppb) of PCE. The Maximum Contaminant Level (MCL) for PCE is 5 ppb, and the draft Public Health Goal established in 1999 by the Office of Environmental Health Hazard Assessment is 0.056 ppb. A public health threat exists because of exposure to contaminated drinking water, other domestic well uses (Attachment 1), and potentially from gases vented to air from shallow groundwater contamination.

[1] The Regional Water Board has notified the Department of Health Services, Department of Toxic Substances, California Environmental Protection Agency, and U. S. Environmental Protection Agency.

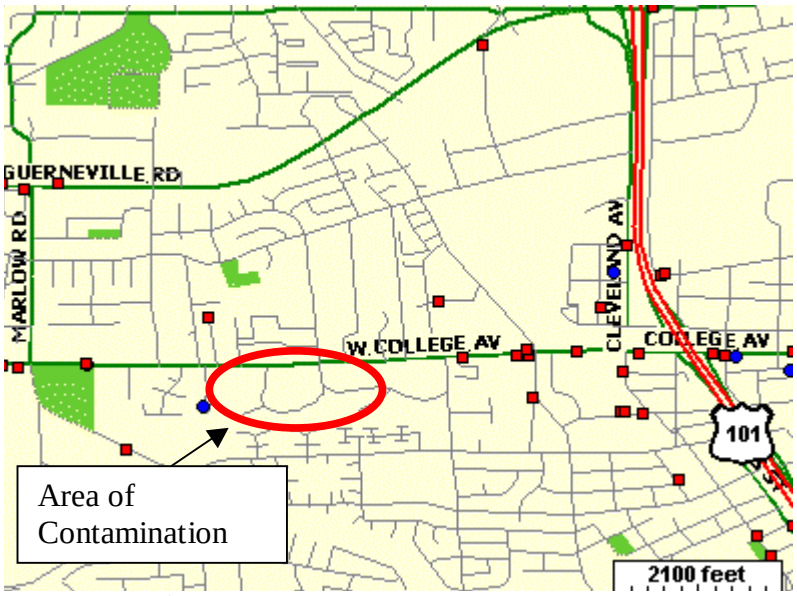

Figure 1. Area of investigation.

On August 1, 2000, Regional Water Board staff requested emergency funds[2] from the the State Water Board C&AA in order to conduct additional sampling of domestic wells. The State Water Board allocated $7,000 on August 17, 2000. On September 21, 2000, staff verbally requested additional funds from the C&AA, and followed up in writing on October 13, 2000 for $15,000 to continue the domestic well sampling. On October 27, 2000, staff verbally requested and received an additional $78,000 to provide water supply replacements for those residences with contaminated drinking water wells. The water supply replacements are either a connection to City water where possible or placement of wellhead treatment units where no City water service is available.

To date, approximately 108 domestic wells have been sampled and analyzed, with 21 wells indicating PCE contamination, and incidences of contamination continue to increase. Late on November 6, staff learned of a residential well contaminated with the highest level of PCE yet detected, 576 ppb. On November 7, staff utilized authorized C&AA funds to engage a contractor to connect the residence to City water, and also engaged a water supplier to place a temporary tanker truck at this residence. The tanker truck was cancelled late on November 7 when the City water connection was verified in place and functioning. On November 10, a tank of potable water was connected to another house with contaminated well water, and is serving as a temporary measure prior to the placement of a wellhead treatment system.

[2] Many news articles have focussed on the timeliness of the funding request and the notification to residents. While such discussion isn't directly applicable to consideration of a further request for cleanup and abatement account funds, staff has prepared a concise summary of our activities from November 1999 through the present time. This summary is included in the agenda package as Attachment 2.

Several other properties with contaminated wells along West College Avenue are accessible to the City water main. Staff has urged the City to expedite the processing of connections to the City system. Staff has prepared the necessary agreements for installation of large activated carbon filter systems on the wellhead of the contaminated wells where no connection to City water is available. Installation commenced on November 17, 2000, and the filters will be maintained by the Regional Water Board contractor until a water main can be installed in the area.

All of these activities, along with ongoing sampling, will soon exhaust the C&AA funds ($100,000) already approved by the State Water Board. An estimate for the cost of connecting seven affected homes to the City water supply was bid at $165,000 on November 14. Approvals over $100,000 require a formal request from the Regional Water Board and approval by the State Water Board.

DISCUSSION

Staff is proposing that the Regional Water Board request additional State Water Board funding from the C&AA. Pursuant to section 13443 of the California Water Code, the C&AA may be accessed by the Regional Water Board for response actions. Section 13443 reads:

> "Upon application by a regional board that is attempting to remedy a significant unforeseen water pollution problem, posing an actual or potential public health threat, and for which the regional board does not have adequate resources budgeted, the state board may order moneys to be paid from the account to the regional board to assist it in responding to the problem."

Attachment 3 addresses each of the cited requirements in detail, but the contamination is significant, unforeseen, and a public health threat for which we have no budgeted resources. The broad work activities requiring funding are:

- Immediate connection where possible of residences impacted by the contaminant plume to the City of Santa Rosa water system;
- Continued immediate placement of wellhead treatment systems on newly found contaminated wells;
- Determining preliminary extent of contamination
- Determination of any additional public health threats, including potential PCE air contamination from the off-gassing of PCE from groundwater;
- Addressing public health concerns related exposures to polluted groundwater; and
- Determination of the source(s) of the contamination and additional responsible parties.

Preliminary evidence indicates that a former dry cleaner located at 946 West College has discharged PCE to the environment. The Executive Officer issued a directive (Attachment 4) under section 13267[3] of the California Water Code requesting a workplan for investigation of the extent of contamination. The directive was issued to the property owner, the Kelly Family Trust, as well as the former operator of the dry cleaner, Ms. Claudette Gibbs.

It is unclear at this time whether either of these responsible parties will be able to implement the necessary investigative, cleanup and abatement activities in the timeframe required to eliminate further public health threats. Further, there may be additional contributors to the contamination and these contributors have not yet been determined. More evidence needs to be gathered to make determinations regarding additional contributors.

CONCLUSION

The following table summarizes the proposed C&AA funding request:

	FY 00-01	**FY 01-02**	**Total**
Contracts	$459,298	$218,605	$677,903
Personal Services	$69,460	$48,000	$117,460
Total	$528,758	$266,605	$795,363

Attachments 5 through 12 detail work activities.

PRELIMINARY STAFF RECOMMENDATIONS: Adopt Resolution No. R-1 2000-____ as proposed.

wcollegeeosr.doc

[3] A Cleanup and Abatement Order issued under section 13304 of the California Water Code is currently being drafted while additional evidence is being gathered. This Order will be issued by the Executive Officer under his delegation authority and a copy will be provided to the State Water Board upon issuance.

Attachment 1

Letter from Dr. Marilyn Underwood is not available electronically

Attachment 2

The following chronology of events occurred between November of 1999 and the present.

- The property owner at 1000 W. College (same as 1040 Clover Drive) approached the Regional Water Board in November of 1999 and indicated he planned on sampling his well, and requested advice on analytical tests. Staff recommended testing for solvents, among other chemicals.

- The property owner sampled the well and reported in November of 1999 that tetrachloroethylene (PCE) was found in the well.

- Regional Water Board staff re-sampled and confirmed findings in early December of 1999.

- Regional Water Board staff went door-to-door in December of 1999 and January of 2000, passing out over 50 business cards with a message asking residents to call us for information.

- During this same door-to-door canvassing, Regional Water Board staff were able to speak with residents regarding the PCE finding at 38 locations east, west, south and north of the intersection of Clover and W. College, including:

-946 Clover	-850 W. College
-1050 W College	-1114 W. College
-830 W College	-1009 Clover
-1010 Clover	-1024/1026 Clover
-1025 Clover	-1021 Wild Rose
-953 Clover	-1013 Wild Rose

- The Regional Water Board staff completed a domestic well sampling plan in March 2000

- The Regional Water Board staff drafted a written request for Cleanup and Abatement Account funds in April of 2000, and the review of this draft was completed in July of 2000. On August 1, staff requested cleanup and abatement account funds in writing, and the request was approved in August of 2000, after which well sampling commenced. However, emergency requests can be accomplished by telephone, provided that the written request follows within a few weeks, and Regional Water Board staff should have responded more rapidly by re-assigning resources to this project to support the needed work efforts. Internal procedures are being modified to ensure such delays would not happen again under similar circumstances.

- Sampling by Regional Water Board staff of over 108 domestic wells started in August of 2000.
- Additional emergency funds were requested on September 21, 2000 to continue sampling the growing number of threatened wells.
- On September 12, October 10, and October 19, Regional Water Board staff met with the City of Santa Rosa, County of Sonoma, and State Department of Health Services regarding this project and mechanisms to immediately abate the threat.
- Additional emergency funds were requested on October 27, 2000 for providing emergency alternative water supplies.
- Informal meeting between Regional Water Board staff and several members of the public occurred on October 27, 2000.
- Public meeting at Finley Center hosted by the City of Santa Rosa on November 6.
- First connection to City water for resident with the highest PCE contamination occurred on November 7, 2000.
- Regional Water Board public meeting at the Finley Center on November 9, 2000.

ATTACHMENT 3

The following facts address each of the requirements of Section 13443:

"*Upon application by a regional board…*": This agenda item is the necessary step in applying to the State Water Resources Control Board.

"*…attempting to remedy a significant unforeseen water pollution problem…*": The pollution near the intersection of West College Avenue and Clover Drive is significant because of the high levels of PCE detected in water wells, and was unforeseen. Remedying the situation involves cleaning up and abating the effects, determining the effects including health exposures, informing the public of activities, and other actions to appropriately address the water pollution problem.

"*…posing an actual or potential public health threat…*" The levels in domestic wells greatly exceed criteria for protecting public health, and the State Department of Health Services has advised the Regional Water Board that these levels are an actual public health threat.

"*…for which the regional board does not have adequate resources budgeted…*": The Regional Water Board has no resources budgeted for this activity.

"*…board to assist it in responding to the problem*": Response to the problem involves abating the effects of contaminated water supply wells, determining the extent of the problem through investigative tasks, identifying responsible parties, determining additional as yet unidentified exposures posing a public health risk, facilitating response to exposure questions, informing the public of work progress, and other related tasks.

ATTACHMENT 4

This attachment is the Section 13267 Letter to the Responsible Parties for the 946 West College Avenue site. It is available electronically, but posted separately on the Internet web page.

ATTACHMENT 5

The proposed work activities for this area will be conducted and completed by Regional Water Board staff and contractors engaged to support the work efforts. The activities associated with the project include:

- Additional connections to City water
- Additional wellhead treatment system installations
- Conducting a soil gas survey
- Conducting air sampling
- Facilitating responses to public health questions regarding exposure to polluted groundwater.
- Collecting additional groundwater samples from domestic wells
- Collecting groundwater samples from underlying aquifers
- Installing groundwater monitoring wells

Additional Connections to City Water: Staff anticipates finding additional contaminated wells with ongoing sampling. Insufficient funds exist in the original $100,000 allocation to provide for these connections.

Additional Wellhead Treatment System Placements: Staff anticipates finding additional contaminated wells with ongoing sampling. Insufficient funds exist in the original $100,000 allocation to purchase, install, and maintain these additional filters.

Conducting a Soil Gas Survey: The discharge of PCE to the environment generally first occurs through a discharge to soil, then shallow groundwater, then migration to deeper aquifers. Contaminated soil gas is usually indicative of a shallow discharge, and shallow discharges are usually close to the place of initial release. The soil gas information will aid in determining the sources of discharge, and will also provide information on the potential off-gassing of PCE from contaminated groundwater in the vicinity of residential homes.

Conducting Air Sampling: PCE is a volatile chemical and can leave the water phase and off-gas into the soils and overlying structures. Air sampling is necessary to ensure that no exposure of residents to PCE in air is occurring.

Facilitating responses to public health questions regarding exposure to polluted groundwater and toxic wastes: Many residents may have been exposed for prolonged periods to levels of contamination far in excess of public health goals. These significant exposures require outreach to the community and local physicians regarding potential health issues

Collecting Additional Groundwater Samples from Domestic Wells: Seasonal changes are expected to affect the groundwater flow regime. The

impact of pumping wells on the flow direction of groundwater will change as high usage summer pumping subsides. In addition, the shallow groundwater table fluctuates up to 12 feet from summer to winter in this area, and this fluctuation may affect the contamination concentrations in individual wells. Those wells which are currently not showing any contamination may begin to show contamination based on these seasonal fluctuations, and additional wet weather testing is needed for wells which are particularly at risk.

Collecting Groundwater Samples from Underlying Aquifers: Domestic well sampling does not provide adequate information on the levels of contamination in underlying affected aquifers. Drinking water wells are often perforated or screened across multiple aquifers, masking the true contaminant levels in any given aquifer. Aquifer-specific samples need to be collected to determine the magnitude and migration of PCE in the area. This information is critical to further define areas of public health risk as well as other potential contributors to the pollution.

Installing groundwater monitoring wells: Multiple level monitoring wells are needed to adequately determine aquifer characteristics, determine the extent of contamination including pollutant concentrations over time, and permit assessment of appropriate remedial actions.

Staff Oversight Funding: Staff oversight[4] of these activities is also necessary in order to obtain and analyze the incoming data, prepare needed documents, respond to public inquiries, ensure adequate public participation, and oversee any contractors.

Cost details on each of these activities is summarized in the following table:

[4] Staff costs are estimated on the current recommended generic billing rate for the Spills, Leaks, Investigations, and Cleanup program. That billing rate is $70.00 per hour. The actual rate may be less.

	ACTIVITY	ESTIMATED COST
1.	Hookup to the City of Santa Rosa (10) Contractor for pipeline excavation, installation, traffic control, repaving work, various fees, etc.	$240,000
2.	Water Treatment Systems Installation of ten additional Systems at $4,000 each and maintenance at $500 each	$45,000
3.	Soil / Gas Survey Approximately 500 Sorbers @ $185.00 each Staff Time $29,120 *See Attachment 6*	$121,620
4.	Air Sampling Approximately 50 canisters and analysis at $335 each Staff time $5,600 *See Attachment 7*	$ 22,350
5.	Health Concerns Outreach Contract Staffing *See Attachment 8*	$ 100,000
6.	Geoprobe Work MIP Work - Staff Time $33,600 Soil & Groundwater Sample Lab Cost $9,930 & Staff Time $22,400 *See Attachment 9*	$ 65,930
7.	Ongoing domestic well sampling Laboratory costs $15,048 Staff costs $9,240 *See Attachment 10*	$ 24,288
8.	Monitoring Well installation Drilling work $120,000 Sampling costs $5075 Staff costs $5,600 *See Attachment 11*	$130,675
9.	Miscellaneous Project Oversight Staff Costs *See Attachment 12*	$45,500
	TOTAL AMOUNT	**$795,363**

ATTACHMENT 6
SOIL GAS SURVEY WORK

The soil gas survey work will be conducted by the Regional Water Board staff through a contract with W. L. Gore & Associates, Inc. Staff will obtain approximately 525 Gore-Sorbers (Sorbers) for installation. Of these, 500 Sorbers will be used for the actual soil / gas survey work and the remaining 25 are to be used as trip blanks. The Sorbers will be installed in the area of West College Avenue and Clover Drive. It is recommended that the Sorbers be placed within 50 feet of each other in order for the results of the analysis to be more accurate.

The Sorbers are placed into a hole 3/4" wide and thirty inches deep. Through previous work with the Sorbers, staff has determined that approximately 40 Sorbers can be installed into the ground per day. Therefore, it will take approximately 13 working days to install all of the Sorbers. The location of the Sorbers will be marked and will also be tracked using the Regional Water Board's GPS.

The Sorber containers are left in the ground for 14 days. Once the Sorber containers are removed from the soil, the containers are shipped back to W. L. Gore & Associates, Inc. The company then analyses the gases trapped inside of the Sorber containers and will generate a report of the analysis. The Sorbers will be analyzed for certain volatile organic compounds (VOCs). The report will indicate areas where the concentration of VOCs is high. These high concentration areas are known as "hot spots." The report generated by this investigation should give us enough information to focus our efforts in a more concentrated area and will help determine the source of the pollution.

Cost of the Sorbers
500 Sorbers X $185.00 = $92,500
Note: There is no charge for the trip blank Sorbers

Cost of Regional Water Board staff time
Minimum of 5 persons needed to install Sorbers
5 X $70.00 (average cost per hour) X 8 hrs X 13 days = $29,120

Total Cost of Project
$92,500 + $29,120 = **$121,620**

ATTACHMENT 7
AIR SAMPLING

Since tetrachloroethene involves a possible inhalation exposure to people living and working in this area, sampling and analysis of air samples are proposed. The analysis of indoor ambient air for volatile organic compounds will be conducted at very low detection limits. Various buildings will be selected for the detailed air quality sampling event. Air will be sampled by using evacuated stainless steel (SUMMA) canisters. An air sample is drawn into the SUMMA canister by opening a valve and allowing the vacuum to come to equilibrium with the ambient pressure. The air samples collected for this project will be obtained over an 8 hour period. The air samples are submitted to a laboratory for analysis.

The SUMMA canister rental cost is $50 per canister. In addition, the flow controller must also be rented. The cost of the controller is $25. Shipping the air samples back to the laboratory will cost approximately $10. The cost of the air sample analysis is $250. Therefore, each air sample will cost $335. It has been estimated that approximately 50 structures should have the air sampling conducted. Therefore, 50 samples X $335 = $**16,750**.

The SUMMA canisters will be placed inside of the structures by staff. It is estimated that 5 people will be needed to help with the air testing, which should be finished within two workdays. Therefore, 16 hours X 5 people X $70 = $**5,600**.

The total cost of this project has been estimated at:
$16,750 + $5,600 = $**22,350**

ATTACHMENT 8
Health Concerns Outreach

The California Department of Health Services, Environmental Health Investigations Branch (DHS-EHIB), has provided and continues to provide considerable information to the public regarding health risks from this unanticipated pollution problem, which poses a public health risk. Many health-related questions are arising because of the possible long-term exposures to contaminated well water. Outreach is necessary to the community and to local physicians to assist in addressing the health concerns. The estimated contract requirement is approximately $100,000.

ATTACHMENT 9
GEOPROBE WORK

Regional Water Board staff will conduct all geoprobe work. Initial geoprobe work will consist of using the Membrane Interface Probe (MIP) in order to determine where actual soil and groundwater samples should be collected for laboratory analysis. The MIP work will be conducted in two phases. The first part of the MIP work will be centered on the utility lines located along and adjacent to West College Avenue. MIP samples will be collected approximately 100 feet laterally along utility lines. It has been estimated that approximately 35 MIP locations will be needed for the survey of the utility lines. Included in the utility line survey is West College Avenue, Lance Drive, Clover Drive (north of West College Avenue), and Kowell Lane. The second portion of the MIP work will be conducted along Wild Rose Drive and Clover Drive (south of West College Avenue). It has been estimated that approximately 25 locations will be needed for this portion of the investigation.

Approximately 4 holes can be drilled per day for MIP work. Therefore, it will take approximately 15 working days to complete the MIP work. Approximately 5 staff will be required in order to conduct the work. Therefore, this portion of the Geoprobe work will cost approximately $33,600 for Regional Water Board staff time.

Geoprobe Soil and Groundwater Sampling

The completed MIP work will determine where soil and groundwater samples should be collected. It is estimated that approximately 30 holes will be needed for soil and groundwater sampling. It is estimated that it will take approximately 10 working days to complete the soil and groundwater sampling work. Approximately 5 staff will be required in order to conduct the work. Therefore, the staff costs for this portion of the work will be approximately $22,400. Laboratory costs for the soil and groundwater samples are as follows:

Soil Samples
Each Sample costs $30 per sample + $40 prep charge + $114 for 8260 analysis = $184
30 samples X $186 = $5,580

Groundwater Samples
Each sample costs $145 for 8260 analysis
30 samples X $145 = $4,350

Total Cost for Soil and Groundwater Sampling Event
$5,580 + $4,350 + $22,400 = $32,330

Total Cost of Geoprobe Work
$33,600 + $32,330 = **$65,930**

(geoprobe.doc)

ATTACHMENT 10

Domestic Well Re-Sampling

All of the domestic water wells in this area will need to be re-sampled for analysis during the rainy season. It is estimated that approximately 132 groundwater samples will be collected. The cost of analyzing a domestic water well using EPA Method 524.2 is $114 per sample.

132 samples X $114 = $**15,048**.

The samples will be collected by Regional Water Board staff. It takes approximately a half hour to sample a domestic water well. In addition, water well sampling is conducted in pairs. The cost of staff time is estimated as follows:

132 samples X ½ hour X 2 people = 132 hours
132 hours X $70 (staff time) = $**9240**

Total cost of the project:

$15,048 + $9,240 = $**24,288**

ATTACHMENT 11
Monitoring Well Installation

Monitoring wells are necessary to characterize the contaminated aquifers. Three wells at different depths are proposed for ten locations. The Regional Water Board will contract for the well construction, and a staff registered geologist will prepare the needed drilling logs.

Each of the ten well clusters is anticipated to cost $12,000, or $120,000. One cluster per day can be drilled, at an estimated staff oversight cost of $5600 for ten days. Laboratory costs for each well plus quality assurance/control samples is estimated to cost $5075. Total costs for this phase of the project is estimated to be $120,000 + $5,600 + 5,075, or $130,675.

ATTACHMENT 12
Estimation of Staff Costs

West College Avenue data analysis, preparation of documents, public participation, and general oversight duties		
PY Estimate		
NCRWQCB Staff	**Hours Worked**	**Total Cost (all averaged at $70/ Hr)**
Senior WRCE	100	
Engineering Geologist	200	
Staff Services Analyst	100	
Environmental Specialist II	125	
Water Resources Control Engineer	125	
TOTAL	650	$45,500